

REMARKS

Claims 1-13 are pending. Claims 1, 6 and 9 have been amended, claims 10-13 were previously presented, and claims 2-5, 7 and 8 were previously amended.

Rejection Under 35 U.S.C. § 103 (a)

Claims 1-13 were rejected under 35 U.S.C. § 103 (a) as being unpatentable over Tomlinson et al., "Fade Countermeasures at Ka Band: Direct Inter-establishment Communications Experiment (DICE)", IEEE Colloquium, December 17, 1991, pages 4/1 – 4/6.

Applicant has avoided these grounds of rejection for the following reasons.

Applicant's claim 1, as amended, now recites,

"selecting a reduced information data rate that is a fraction of a full data rate R , wherein the reduced information data rate is $1/4$ of the full data rate R ;
randomizing the reduced data rate information signals to produce an encoded data stream at the full data rate R ; and
transmitting the encoded data stream;
wherein the reduced information data rate results in an enhanced signal-to-noise ratio, per bit of information, that is increased by a factor of four due to reduction in the information data rate increasing the energy per bit, and wherein transmittal of the encoded data stream at the full data rate ensures that power flux density will not be significantly changed."

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Applicant's claim 6, as amended, now recites,

"means for reducing the rate of an information data stream to be transmitted from a full rate R to a selected reduced rate, wherein the selected reduced rate is $1/4$ of the full data rate R;

a pseudorandom noise source generating a stream of practically random data at the full data rate R;

means for logically combining the reduced rate information data stream and the data stream from the pseudorandom noise generator; and

means for transmitting the logically combined data stream;

wherein signal-to-noise performance of the transmitter is enhanced without increasing power flux density levels;

wherein the reduced information data rate results in an enhanced signal-to-noise ratio, per bit of information, that is increased by a factor of four due to reduction in the information data rate increasing the energy per bit."

Applicant's claim 11, as amended, now recites,

"a data rate control device operable to reduce the rate of an information data stream to be transmitted from a full rate R to $1/4$ of the full data rate R;

a pseudorandom noise source operable to generate a stream of practically random data at the full data rate R;

a first logical exclusive OR circuit operable to combine the reduced rate information data stream and the data stream from the pseudorandom noise generator;

a transmitter operable to send the logically combined data stream;

a receiver operable to demodulate the logically combined data stream;

a second pseudorandom noise source located near the receiver, operable to generate a stream of data identical with the one produced by the first pseudorandom noise source; and

a second logical exclusive OR circuit operable to combine the demodulated data stream with the data stream from the second pseudorandom noise source, to recover the original data stream at the reduced data rate;

wherein the reduced information data rate results in an enhanced signal-to-noise ratio, per bit of information, that is increased by a factor of four due to reduction in the information data rate increasing the energy per bit, and wherein transmittal of the encoded data stream at the full data rate ensures that power flux density will not be significantly changed."

In support of the rejection, the Examiner stated: "Regarding claim 6, Tomlinson et al. discloses digital communication apparatus, as shown in Fig. 1, comprising: means, which is obvious to have the "means" to perform the feature having the rate of an information data stream to be transmitted from an original signaling rate R to a selected reduced rate using a direct-sequence spread spectrum system [Fig. 1]; a pseudorandom noise source (PRC generator) generating a stream of practically random data at the original signaling rate R (i.e. at a chip rate) [Fig. 1]; means (Exclusive OR)

for logically combining the reduced signaling rate information data stream and the data stream from the pseudorandom noise generator Fig. 1]; and means (channel) for transmitting the logically combined data stream at the original signaling rate [Fig. 1]; wherein signal-to-noise performance is enhanced (due to the use of the higher spreading factor) to compensate for rain attenuation (i.e. the fading of signals due to rain) without increasing power levels [page 2; lines 6-10; Page 2, Section 2, line 1 to page 3, line 6].

Regarding the claimed amount rate for reducing the rate of an information data stream to be transmitted from an original signaling rate R to a selected reduced rate using a direct-sequence system [Fig. 1], it would have been obvious to a person of ordinary skill in the art, at the time of the invention, to select any power value of a fraction of a full data rate including a $1/4$ of the full data rate as a matter of design choice."

Tomlinson discloses reducing the information rate with respect to the chirp rate in a direct sequence spread spectrum system. However, Tomlinson does not disclose a set value for the decrease in the source data rate. The independent claims of the present application include the limitation: "the reduced information data rate is $1/4$ of the full data rate R ". This is not simply a design choice. According to the present specification digital data at its maximum rate (R) bits per second is subject to data rate control, which reduces the information data rate, optionally, to a selected fraction, $1/n$, of the full data rate R . Such is neither taught nor suggested by Tomlinson.

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The Examiner has stated that any power value of a fraction of a full data rate could be selected. However, as explained in the present specification not just any fraction of a full data rate can be selectable to achieve the present invention.

The dependent claims include all the limitations of the independent claims upon which they depend, and therefore for the reasons set forth above with regards to the independent claims, these dependent claims are deemed to be allowable over any combination of the cited prior art.

Conclusion

Reconsideration and withdrawal of the rejections is therefore respectfully requested. In view of the above remarks, allowance of all claims pending is respectfully requested.

The prior art made of record and not relied upon is considered to be of general interest only. This application is believed to be in condition for allowance, and such action at an early date is earnestly solicited. If a telephone conference would be of assistance in advancing the prosecution of this application, the Examiner is invited to call applicant's attorney.

Respectfully submitted,



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